






BMP #14 - Matting

Targeted Pollutants

-  Sediment
-  Phosphorus
-  Trace metals
-  Bacteria
-  Petroleum hydrocarbons

Physical Limits

Drainage area 100 ac

Max slope 100%

Min bedrock depth 2 ft

Min water table N/A

SCS soil type ABCD

Freeze/Thaw good

Drainage/Flood control no

DESCRIPTION

A porous net or fibrous sheet that is laid over the ground surface for slope stabilization and erosion control, or to hold a mulch in place and protect it against wind or water damage. Matting and netting are sometimes classified as geotextiles (see BMP #13), but in this catalog, matting is considered to be materials made from biodegradable materials including straw, coconut (coir), jute, wood fiber (excelsior), paper, and cotton. Some of these organic materials may be held in place by plastic netting.

APPLICATIONS

A wide variety of matting materials may be used for erosion control. Most are of two main types: woven—such as jute, or bonded to plastic—such as excelsior. Application examples for these two types are listed below.

Jute matting: Jute matting or netting is available as a heavy fiber net which is generally purchased in rolls and is stapled/anchored to slopes to provide a uniform covering. This covering protects mulches, provides additional water-holding capacity, and aids in moderating environmental fluctuations near the ground surface (as does a mulch).

Jute matting can be applied over straw, grass hay, wood fiber, or manure mulches when wind or water damage would occur without a protective net. Matting is the best single method for protecting the integrity of a mulched area. It may be applied alone as an alternative to straw or wood fiber mulches on flat sites for dust control and seed germination enhancement, but

should not be applied alone where runoff quantities are significant.

Wood fiber (Excelsior) matting: Wood fiber matting is made by bonding wood excelsior fibers to a paper or plastic reinforcing net. The matting is generally purchased in rolls and stapled to slopes to provide a uniform covering which can protect mulches, provide enhanced water-holding capacity, and aid in moderating environmental fluctuations near the ground surface.

Matting can be useful in the following circumstances:

- Construction sites becoming temporarily inactive (inactive period greater than two weeks and less than one year).
- Graded areas receiving permanent revegetation treatment by seeding.
- Bare areas receiving permanent revegetation treatment by seeding.

Plastic netting: Plastic netting (photo/biodegradable) is a monolithic plastic clothlike material. It is used primarily to hold straw and other materials in place. Plastic netting is more durable than jute or wood fiber matting. It is much easier to handle and requires less labor, but has no mulch capabilities itself.

Plastic netting alone provides no soil stabilization or erosion control. It is best used to hold down mulches until vegetation becomes established.

LIMITATIONS

- Should not be used where overland water flow will exceed 6.5 ft/s (2 m/s). Because of the following characteristics of plastic netting and wood fiber matting, jute matting, straw or straw coconut matting are preferred.
- Plastic netting does not function as a mulch (as does jute matting) since it does not absorb water. When plastic netting is used to anchor straw mulch, it increases the effectiveness of the mulch, but does not provide direct control of erosion and sedimentation or nutrient generation. Straw mulch rates should be increased 25 percent when plastic netting is used instead of jute or straw.
- Wood fiber matting is more difficult to put in place than jute, and is less predictable in controlling erosion. Properly applied, it can be as effective as jute matting at sediment and nutrient reduction. However, it is often 10 to 20 percent less effective.

DESIGN PARAMETERS

- Jute matting should be fiber cloth of a uniform plain weave, undyed and unbleached single jute yarn, 3 to 4 ft (1.0 to 1.2 m) wide and weighing an average 0.4 lb per linear foot (600 grams per linear meter) of cloth with a tolerance of plus or minus 5 percent. It should have approximately 78 warp ends per width of cloth and 45 weft ends per linear meter of cloth. The yarn shall be of a loosely twisted construction having an average twist of not less than 6.3 turns per 4 in (100 mm) and should not vary in thickness by more than half of its normal diameter.
- Wood fiber matting should consist of machine-produced mats of curled wood excelsior, of which 80 percent have a 8 in (200 mm) or longer fiber length. It should be of consistent thickness with the fiber evenly distributed over the entire area of the blanket (backing). The top side of each blanket should be covered with a 1 x 3 in (25 x 75 mm) weave of twisted Kraft paper or biodegradable plastic mesh that has a high wet strength. Blankets should be fire and smolder resistant and contain no chemical additives. Blankets shall be in rolls 3 to 4 ft (1.0 to 1.2 m) wide and 130 to 200 ft (40 to 60 m) long.
- Plastic netting with mesh opening from 1/10 x 1/10 in (3 x 3 mm) to 1/5 x 1/5 in (6 x 6 mm) should be applied over straw mulch similarly to the method specified below for jute matting.

Effectiveness: Jute matting acts similarly to straw mulch or hydromulch. Sediment reduction is typically 70 to 90 percent for up to 6 months, 40 to 60 percent for up to 2 years, and 10 to 30 percent beyond 2 years. Nutrient reduction is estimated at 50 to 70 percent for 6 months, 20 to 50 percent for up to 2 years, and 0 to 10 percent beyond 2 years.

Due to the difficulty of proper application, wood excelsior matting has a more variable effectiveness than straw, jute, or hydromulch. Properly applied, it can be as effective. Sediment reduction should range from 50 to 90 percent, 20 to 60 percent, and 0 to 30 percent in 6 months, 2 years, and beyond 2 years, respectively. Nutrient reductions for the same time periods are estimated to be 30 to 70 percent, 10 to 50 percent, and 0 to 10 percent.

CONSTRUCTION GUIDELINES

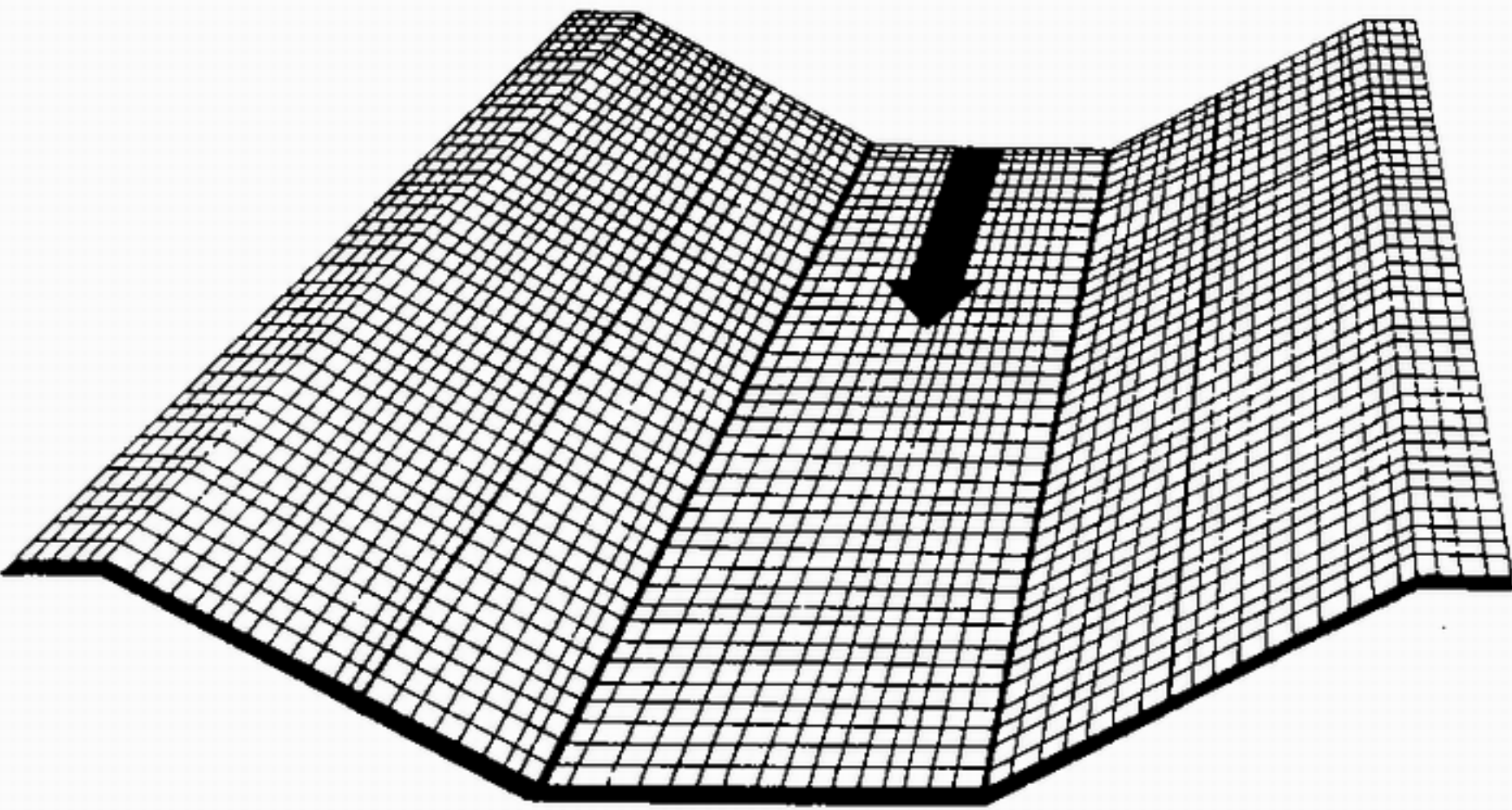
The following guidelines apply to all matting and netting installations.

- The soil must be reasonably smooth. Fill and compact any gullies and rills. Rocks, vegetation or other obstructions which rise above the level of the soil should be removed.
- After site preparation and seeding (if any), the rolls of netting or matting should be rolled onto the surface from the top of the slope to the bottom of the slope. It is preferred that rolls are not constructed in a horizontal direction across the slope face. The rolling should follow water flow direction.
- At the top of the area, bury the end of each roll in a trench at least 8 in (200 mm) deep. The trench should then be backfilled and tamped.
- Overlap the sides of rolls at least 4in (100 mm), and make sure that there is at least a one-meter overlap when an uphill roll joins to a downhill roll. The uphill roll should overlie the downhill roll.
- Extend the matting beyond the edge of the mulched or seeded area at least 1 ft (300 mm) at the sides and one meter at the top and bottom of the area. If existing vegetation or structures mark the boundaries of the area, the matting should continue into the stable vegetated area or to the edge of the structure.
- Staples should be driven perpendicularly into the slope face. Place them approximately 3 ft (1.0 m) apart down the sides and center of the roll, and not more than 1 ft (300 mm) apart at the upper end of a roll or at the end overlap of two rolls.
- Staples should be of heavy gauge wire 7/100 in (2 mm in diameter or greater), bent into a "U" shape, with legs at least 6 in (150 mm) long, and a 1 in (25 mm) crown. Use longer staples and greater frequency in loose or sandy soil.
- Be sure the matting makes uniform contact with the slope face underneath. No "bridging" of rills or gullies should be allowed.
- If wood fiber matting is to be applied without other mulches, the minimum thickness of mat should be 1.5 (40 mm). If the mat is to be applied over other mulches, the minimum mat thickness shall be 0.6 (15 mm).

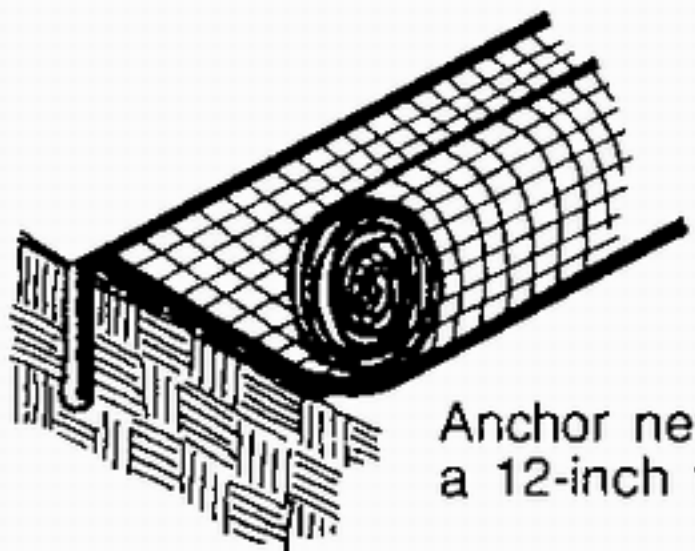
MAINTENANCE

Inspect at regular intervals and after each runoff-producing storm event. Make repairs as necessary to restore complete coverage and full effectiveness of the matting or netting.

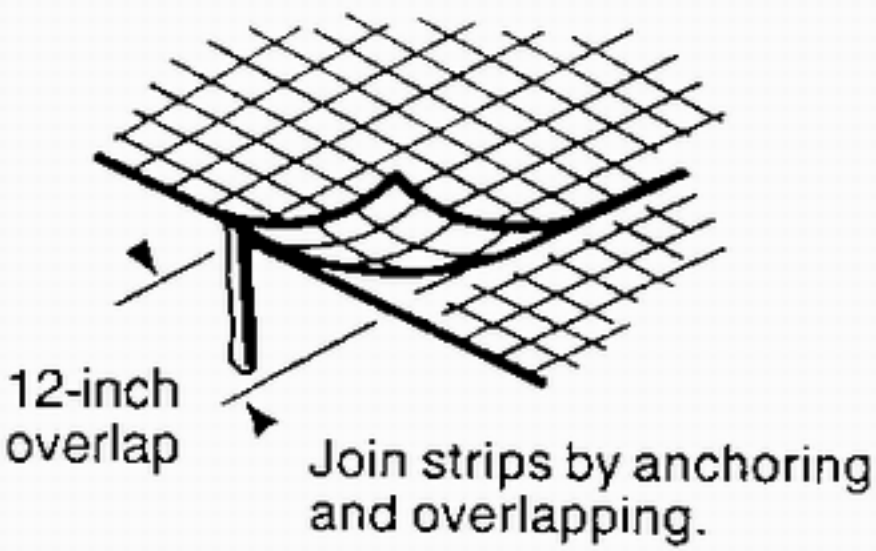
Matting (North Carolina, 1988; adapted from Va. Div. of Forestry)



In channels, roll out strips of netting parallel to the direction of flow and over the protective mulch.



Anchor netting in a 12-inch trench



12-inch overlap

Join strips by anchoring and overlapping.